UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,152	09/25/2006	Hideomi Koinuma	063111	6075

38834 7590 04/29/2009

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER	
HO, ANTHONY	
ART UNIT	PAPER NUMBER
2815	

MAIL DATE	DELIVERY MODE
04/29/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,152	KOINUMA ET AL.	
	Examiner	Art Unit	
	ANTHONY HO	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-7 and 9-24* is/are pending in the application.

4a) Of the above claim(s) *11-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-7,9,10 and 21-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This is in response to amendment to application no. 10/594,154 filed on February 24, 2009.

Claims 1, 2, 4-7 and 9-24 are presented for examination.

Claims 11-20 stand withdrawn.

Claims 3 and 8 have been cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4-7, 9, 10 and 21-24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kelley et al (US Patent 6,433,359).

In re claims 1 and 6, Kelley et al discloses a transistor with a buffer layer (16) and an organic thin film (18) sequentially deposited on a substrate; wherein said buffer layer consisting essentially of pentacene (*it is well known in the art that pentacene has many derivatives and applicants have not specifically claimed a pentacene that is different from the pentacene discussed in column 5, line 28 to column 6, line 6 of Kelley*) (Figure 1; column 3 – column 7).

The recitation "said buffer layer accelerates two dimensional growth of said organic thin film, and orients said organic thin film flatly" in the claim is functional language and is treated as nonlimiting since it has been held that in device claims, the device must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference. See MPEP 2114.

In re claims 2 and 7, Kelley discloses a thin layer (14) between the substrate (26) and the buffer layer (Figure 1; column 3 – column 7).

The recitation "characterized in that a layer easily oriented with said buffer layer" in the claim is functional language and is treated as nonlimiting since it has been held that in

device claims, the device must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference. See MPEP 2114.

In re claims 3, 8 and 21-24, Kelley et al discloses the substrate is an insulating substrate and the buffer layer and organic thin film comprises one of the listed materials (column 3 – column 7).

Claim Rejections - 35 USC § 103

Claims 1, 2, 4-7, 9, 10 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley et al (US Patent 6,433,359) in view of Afzali-Ardakani et al (US PUB 2004/0183070).

Kelley et al discloses a transistor with a buffer layer (16) and an organic thin film (18) sequentially deposited on a substrate; wherein said buffer layer consisting essentially of pentacene (*it is well known in the art that pentacene has many derivatives and applicants have not specifically claimed a pentacene that is different from the pentacene discussed in column 5, line 28 to column 6, line 6 of Kelley*) (Figure 1; column 3 – column 7).

The recitation "said buffer layer accelerates two dimensional growth of said organic thin film, and orients said organic thin film flatly" in the claim is functional language and is treated as nonlimiting since it has been held that in device claims, the device must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference. See MPEP 2114.

Afzali-Ardakani et al discloses a buffer layer (110) of an organic semiconductor device comprises pentacene (paragraph 0070) and the substrate (100) is a sapphire substrate (paragraph 0069) (Figure 4a).

The advantage is to avoid using high-temperature or costly, high-vacuum processes to obtain the organic semiconductor devices (paragraph 0023).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transistor as taught by Hirai with a buffer layer of an organic semiconductor device comprises pentacene and the substrate is a sapphire substrate as taught by Afzali-Ardakani et al in order to avoid using high-temperature or costly, high-vacuum processes to obtain the organic semiconductor devices.

In re claims 2 and 7, Kelley discloses a thin layer (14) between the substrate (26) and the buffer layer (Figure 1; column 3 – column 7).

The recitation "characterized in that a layer easily oriented with said buffer layer" in the claim is functional language and is treated as nonlimiting since it has been held that in device claims, the device must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference. See MPEP 2114.

In re claims 3, 8 and 21-24, Kelley et al discloses the substrate is an insulating substrate and the buffer layer and organic thin film comprises one of the listed materials (column 3 – column 7).

Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrakopoulos et al (US PUB 2004/0161873) in view of Hirai (US PUB 2003/0160235).

Dimitrakopoulos et al discloses a transistor with a buffer layer (18) and an organic thin film (16) sequentially deposited on a substrate (10); wherein said buffer layer consisting essentially of pentacene (*it is well known in the art that pentacene has many derivatives and applicants have not specifically claimed a pentacene that is different from the pentacene disclosed in Dimitrakopoulos*) (see Figure 5) (Figures 2-3; paragraph 0046 – paragraph 0059).

The recitation "said buffer layer accelerates two dimensional growth of said organic thin film, and orients said organic thin film flatly" in the claim is functional language and is treated as nonlimiting since it has been held that in device claims, the device must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference. See MPEP 2114.

Hirai discloses the organic thin film comprises fullerene (paragraph 0097).

The advantage is to decrease the cost of manufacturing a semiconductor device (paragraph 0003 – paragraph 0005).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the transistor as taught by Dimitrakopoulos et al with the organic thin film comprises fullerene as taught by Hirai in order to is to decrease the cost of manufacturing a semiconductor device.

Response to Arguments

Applicant's arguments filed February 24, 2009 have been fully considered but they are not persuasive.

In response to applicant's argument that Kelley does not teach a buffer consisting essentially of a pentacene or pentacene fluoride, examiner asserts that it is well known in the art that pentacene has many derivatives and applicants have not

specifically claimed a pentacene that is different from the pentacene discussed in column 5, line 28 to column 6, line 6 of Kelley. For example, the term “pentacene” is broad enough to encompass many different derivatives of pentacene.

In response to applicant's arguments against the references individually (i.e. the rejection of Kelley et al in view of Afzali-Ardakani et al), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that "there is no basis whereby a skilled artisan would replace the in depth precursor self-assembled monolayer of Kelly with the pentacene precursor of Afzali-Ardakani," the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that "[a] skilled artisan would not replace these compositions with a buffer material consisting essentially of pentacene or pentacene fluoride, as doing so would clearly destroy the intended function of Dimitrakopoulos's monolayer," the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or

all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY HO whose telephone number is (571)270-1432. The examiner can normally be reached on M-Th: 10:30AM-9:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. H./
Examiner, Art Unit 2815
/Kenneth A Parker/
Supervisory Patent Examiner, Art Unit 2815